Determination of biochemical values in mules

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Introduction

It has grown in Brazil the use of mules for walks and functional evidence. This has led to increased concern about animals health, but little is known about its laboratory values, both in Brazil and in other countries.

Objectives

To determine biochemical values in mules.

Methods

260 healthy mules, male and female, divided into three age groups (G1- 2 months to 1 year old; G2- 1 to 3 years old; G3- above 3 years old) were evaluated. Jugular venous blood samples were collected in vacuum tubes. Glucose, urea, creatinine, triglycerides, cholesterol, protein, albumin, AST, GGT, ALP, LDH, total and direct bilirubin, CK, Ca, P, Fe, Mg were performed in automatic analyzer Daytona® (Randox). The ratings of Cl, Na and K were performed on analyzer COBAS® B121 (Roche).

Results

Statistically (Table 1), G1 had lower total protein overall, urea and Na, and higher glucose, P and K. G2 had higher AST. G3 had higher Fe and lower LDH. ALP showed steady decrease with increasing age.

Discussion

There are few reports on mules to compare these results, with some results of G3 similar to literature and others not. Several parameters were not evaluated in other researches, and none of them were in age ratings or evaluation of such a large number of animals. Also it was observed similarities and differences compared to reference values for horses and donkeys.

Conclusions

Mules have their own biochemical values, both in comparison to other species, and for each age group.

References

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Table 1 - Biochemical values in mules of three age groups.

	G1	G2	G3		G1	G2	G3
Protein (g/dL)	6,13 ± 0,88a	6,96 ± 0,77b	6,84 ± 0,62b	**Glucose (mg/dL)**	104,44 ± 17,21[a]	89,35 ± 13,86[b]	89,34 ± 11,27[b]
Albumin (g/dL)	3,18 ± 0,30	3,27 ± 0,22	3,22 ± 0,29	**Triglycerides (mg/dL)**	48,15 ± 19,69	43,34 ± 19,54	42,47 ± 21,02
AST (U/L)	133,71 ± 20,30[a]	153,38 ± 35,55[b]	137,19 ± 33,27[a]	**Cholesterol (mg/dL)**	108,64 ± 30,38	91,29 ± 13,16	91,57 ± 53,09
GGT (U/L)	18,53 ± 12,23	17,05 ± 8,53	17,49 ± 11,13	**Lactato (mmol/L)**	3,15 ± 0,96[a]	2,44 ± 1,08[b]	2,46 ± 0,89[b]
T Bil (mg/dL)	0,82 ± 0,43	0,80 ± 0,54	0,84 ± 0,53	**Ca (mg/dL)**	11,64 ± 0,72	11,51 ± 0,73	11,50 ± 0,79
D Bil (mg/dL)	0,23 ± 0,19	0,26 ± 0,19	0,27± 0,15	**P (mg/dL)**	5,86 ± 1,43[a]	3,99 ± 0,72[b]	3,22 ± 0,75[c]
creatinine (mg/dL)	1,12 ± 0,16	1,14 ± 0,16	1,17 ± 0,16	**Cl (mmol/L)**	98,20 ± 1,85	101,42 ± 4,46	101,41 ± 7,61
urea (mg/dL)	27,58 ± 13,02[a]	33,79 ± 8,92[b]	31,42 ± 7,19[ab]	**Na (mmol/L)**	135,82 ± 1,75[a]	137,69 ± 4,73[ab]	138,37 ± 3,80[b]
ALP (U/L)	502,96 ± 170,05[a]	389,69 ± 138,63[b]	300,24 ± 99,22[c]	**K (mmol/L)**	4,57 ± 0,40a	4,44 ± 0,77a	4,01 ± 0,49b
LDH (U/L)	368,14 ± 123,71[a]	378,58 ± 104,30[ab]	326,03 ± 99,45[b]	**Fe (µmol/L)**	23,81 ± 8,91[ab]	21,29 ± 5,63[a]	25,00 ± 7,74[b]
CK (U/L)	95,97 ± 34,12	124,19 ± 48,26	108,41 ± 56,42	**Mg (mmol/L)**	0,93 ± 0,13	0,88 ± 0,12	0,88 ± 0,14